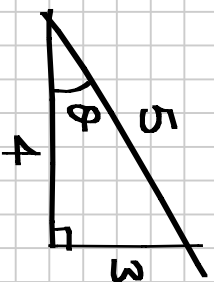


C3 Exercise 7B

Note Title

07/10/2010

7 Given that $\tan \theta = \frac{3}{4}$ and that θ is acute

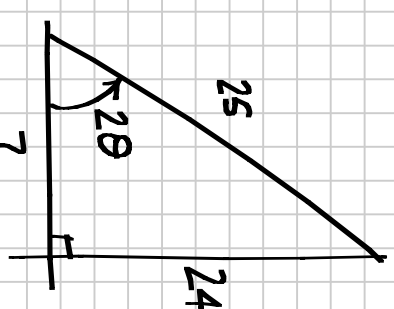


$$\sin \theta = \frac{3}{5}$$

$$\cos \theta = \frac{4}{5}$$

$$\begin{aligned} \tan 2\theta &= \frac{2 \tan \theta}{1 - \tan^2 \theta} = \frac{\frac{6}{4}}{1 - \frac{9}{16}} = \frac{24}{7} \end{aligned}$$

$$\sin 2\theta = 2 \sin \theta \cos \theta = 2 \times \frac{3}{5} \times \frac{4}{5} = \frac{24}{25}$$



$$\begin{aligned} \cos 2\theta &= \cos^2 \theta - \sin^2 \theta = \frac{16}{25} - \frac{9}{25} = \frac{7}{25} \end{aligned}$$

7b

$$\sin 4\theta = \sin(2\theta + 2\theta) = 2\sin 2\theta \cos 2\theta$$

$$= 2 \frac{24}{25} \times \frac{7}{25}$$

$$= \frac{336}{625}$$

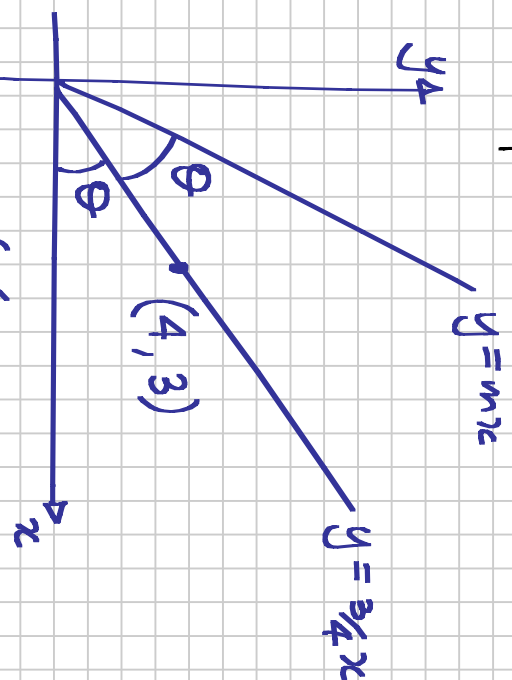
12 line l with equation $y = \frac{3}{4}x$ bisects the angle between the x -axis and the line $y = mx$ for $m > 0$.

Given that the scales on the axes are the same and that l makes angle θ with the x -axis.

(a) Write down the value of $\tan \theta$

(b) Show that $m = \frac{24}{7}$

(a) $\tan \theta = \frac{3}{4}$



(b)
$$m = \tan 2\theta = \frac{2 \tan \theta}{1 - \tan^2 \theta} = \frac{6/4}{1 - 9/16} = \frac{6/4}{7/16} = \frac{6 \times 16}{7} = \frac{24}{7}$$